

**CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**Cambridge International General Certificate of Secondary Education**

## **MARK SCHEME for the October/November 2014 series**

### **0580 MATHEMATICS**

**0580/31**

Paper 2 – Core, maximum raw mark 104

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### Abbreviations

cao	correct answer only
dep	dependent
FT	follow through after error
isw	ignore subsequent working
oe	or equivalent
SC	Special Case
nfww	not from wrong working
soi	seen or implied

Qu.	Answers	Mark	Part Marks
<b>1</b>	<b>(a) (i)</b> $540 \div 9$ <i>their</i> $60 \times (9 + 7 + 4 + 5)$ $1500 \div 1000$	<b>M1</b> <b>M1FT</b> <b>A1</b>	Alternative method <b>M1</b> $540 \div 1000$ <b>M1FT</b> <i>their</i> $0.54 \div 9$ <b>A1</b> $0.06 \times (9 + 7 + 4 + 5)$  If 0 scored <b>SC1</b> for $0.54 + 0.42 + 0.24 + 0.3$
	<b>(ii)</b> 300	<b>2</b>	<b>M1</b> for $5 \div (9 + 7 + 4 + 5) \times 1500$ or $(540/9) \times 5$ or $60 \times 5$
	<b>(iii)</b> 210	<b>2FT</b>	<b>M1</b> for $70 \div 100 \times$ <i>their</i> <b>(a)(ii)</b> oe
	<b>(b) (i)</b> 2.25	<b>1</b>	
	<b>(ii)</b> 52.6[0]	<b>2</b>	<b>B1</b> for 14 or $(7/8) \times 16 \times 3.4[0]$
	<b>(iii)</b> 46.1	<b>3FT</b>	<b>M2</b> for <i>(their</i> <b>(b)(ii)</b> $- 36) \div 36 \times 100$ or <b>M1</b> for <i>their</i> <b>(b)(ii)</b> $- 36$  <b>M2</b> for <i>their</i> <b>(b)(ii)</b> $\div 36 \times 100 - 100$ <b>M1</b> for <i>their</i> <b>(b)(ii)</b> $\div 36$ [ $\times 100$ ]
<b>2</b>	<b>(a) (i)</b> Trapezium	<b>1</b>	
	<b>(ii)</b> 16 cm <sup>2</sup>	<b>2</b> <b>1</b>	<b>M1</b> for $\frac{1}{2}(2 + 6) \times 4$ oe
	<b>(b)</b> Rotation	<b>B1</b>	Independent marks
	90°[anti-clockwise] oe	<b>B1</b>	
	[centre] (–2, –8)	<b>B1</b>	
	<b>(c) (i)</b> Correct reflection in $y = 0$	<b>2</b>	<b>SC1</b> for correct reflection in $x = 0$
	<b>(ii)</b> Translation 5 left and 7 up	<b>2</b>	<b>SC1</b> for one of 5 left or 7 up

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	(iii)	Correct Enlargement	2	SC1 for enlargement, SF ½, but incorrectly placed.
	(d)	Obtuse angle marked	1	
3	(a) (i)	4 points correctly plotted.	2	B1 for 1 correct
	(ii)	Correct continuous ruled line of best fit.	1	Dependent on at least 8 points on graph
	(iii)	Distance on their line of best fit.	1FT	FT their single straight line in part (ii).
	(iv)	Negative	1	
	(v)	Faster the time, the longer the distance oe	1	
	(b) (i)	11.7 or 11.69... NFWW	2	M1 for Attempt at $\sum f \div 12$
	(ii)	41.7 or 41.66 to 41.67	2	B1 for $\frac{5}{12}$ seen
	(iii)	2.45	1	
4	(a)	$x + x + 180 = 480$ $2x = 300$	M1 M1	
	(b)	1060 [cm]	2	M1 for $2 \times 480 + 2 \times (20 + 30)$ oe
	(c) (i)	16 500	2	M1 for $30 \times 150 + 50 \times 180 + 20 \times 150$ oe
	(ii)	2 805 000	1FT	FT their (c)(i) $\times 170$
	(iii)	44.9 or 44-88	2FT	FT their (c)(ii) $\div 100^3 \times 16$ M1 for their (c)(ii) $\times 16$

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5	(a)	6003 076	1	
	(b) (i)	−0.375	1	
	(ii)	−2.2	1	
	(iii)	>	1FT	FT their answers to (i) and (ii)
	(c)	3945, 3955	1, 1	SC1 for both correct but reversed
	(d)	1.667 cao	2	B1 for $1\frac{2}{3}$ or better
	(e) (i)	1	1	
	(ii)	$\frac{1}{125}$	1	
	(iii)	$24x^9$	2	B1 for $24x^k$ or $kx^9$
6	(a) (i)	4, 7, 4	2	B1 for 2 correct
	(ii)	7 points correctly plotted	3FT	B2 for 5 or 6 correct B1 for 3 or 4 correct
		Correct curve through the points	1	
	(iii)	$x = 0$	1	
	(iv)	2.7 to 2.9, −2.7 to −2.9	1, 1	
	(b) (i)	Points correctly plotted and a ruled line through points and beyond them.	2	B1 for 1 correct plot. (even if line is not drawn)
	(ii)	$[y =] -2x + 4$	3	B2 for $-2x + j$ or B1 for $kx + 4$ $k \neq 0$ or [gradient =] $\frac{\text{rise}}{\text{run}}$ correct values
	(iii)	(−1.2 to −1.4, 6.4 to 6.6)	1	
7	(a)	106 to 110	1	
	(b) (i)	Correct bisector of $AB$ constructed with 2 pairs of arcs.	2	B1 for correct bisector
	(ii)	Correct bisector of angle $ABC$ with arcs	2	B1 for correct bisector without arcs
	(iii)	T marked at intersection of their bisectors	1FT	

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	(c)	24.4[km] to 26.0[km]	2FT	FT <i>their AT</i> B1 for <i>their AT</i> correctly measured.
	(d)	Circle, radius 7.5( $\pm 0.2$ )cm centre <i>T</i> .	2FT	FT <i>their</i> intersection SC1 for circle centre <i>T</i> , incorrect radius.
	(e)	No It is outside the circle. oe	1FT	FT <i>their</i> circle.
8	(a) (i)	Correct diagram with scale	3	B1 scale correct. B1 for all widths the same B1 for all 6 heights correct
	(ii)	10 to 12 cao	1	
	(iii)	$\frac{19}{120}$ or 0.158[3....] or 15.8[3.....]%	1	
	(b)	Probability must be between 0 and 1 oe	1	
	(c) (i)	$\frac{9}{20}$ or 0.45 or 45%	1	
	(ii)	0 oe	1	
9	(a) (i)	18 23 28	1, 1, 1	Allow one mark for each addition of 5 to the previous answer
	(ii)	Add 5 oe	1	
	(iii)	$5n - 2$ oe	2	B1 for $5n + j$ or $kn - 2$ $k \neq 0$
	(iv)	73	1FT	FT <i>their (a)(iii)</i> if linear.
	(b) (i)	10 14	1, 1	Allow 1 mark for addition of 4 on their value for 3rd diagram.
	(ii)	$4n - 2$ oe	2	B1 for $4n + j$ or $kn - 2$ $k \neq 0$